# WEATHER FORECASTS AND WARNINGS.

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## NORTHERN HEMISPHERE PRESSURE DISTRIBUTION.

High pressure continued over the Aleutian Islands during the first week of the month but thereafter only an occasional report was received. Over northern Alaska pressure was comparatively high during the first half of the month and low over the second, without any great fluctuations. Over southern Alaska low pressure was the rule with decided disturbances on the 4th, 9th, and 28th. Over the United States proper high pressure largely predominated and there were no lows worthy of special mention. On the 12th and 13th there were some slight indications of a disturbance west of and near the Windward Islands, but no developments resulted. High pressure also prevailed over the Atlantic Ocean, with but a single decided departure over the east-central portion on the 24th, when there was a depression that extended northward over Iceland. Over Iceland and the British Isles marked high pressure prevailed during the first decade of the month, followed over Iceland by an equally marked two-day depression that extended southward over the British Isles and continued there for several days longer. Afterwards high pressure again ruled, except from the 24th to the 26th, inclusive, when the low from the Azores passed northward. Again over western Europe moderately high pressure prevailed with a five-day interruption from the 13th to the 17th, inclusive. Over northern and central Russia pressure was also high, except on the 11th and 12th, with strong crests on the 25th and 26th, while over southern Russia fluctuations were small, with a below-normal tendency until the last four days of the month.

Over Siberia there was a succession of high and low areas of no particular consequence except on the 22d and 23d, when there was a considerable fall over the interior and on the 20th, when a well-defined coast low extended southward over Japan. Moderately high pressure prevailed over extreme northeastern China throughout the month, but southward to the Philippine Islands there were occasional depressions of fair proportions.

## WEATHER IN THE UNITED STATES.

On the morning of September 1, when pressure was high over New England and low west of the Mississippi River, radiograms from vessels in approximately latitude 33° north and longitude 75° west showed falling pressure and strong north winds, indicating the presence of a disturbance a short distance to the southeastward. On August 29 there was a slight pressure fall over the Windward Islands to the southeastward and the fall probably drifted normally to the northwestward without attaining true cyclonic development until assisted by the heat and moisture of the Gulf Stream during the night of August 31-September 1. Storm warnings were ordered from Wilmington, N. C., to Norfolk, Va., and on the morning of September 2, while no radiograms from the vicinity were received, it was apparent that the storm center was approaching the North Carolina coast. Pressure remained high over New England and the northeast winds on the North Carolina and Virginia coasts were increasing. On the morning of September 3, the storm center was very near the northeastern North Carolina coast, a radiogram from a vessel near Hatteras reporting a wind velocity of 56 miles an hour from the south, while at Cape Henry, Va., at the same time it was 46 miles an hour from the northeast. The rains had extended into North Carolina and Virginia and pressure had fallen considerably to the northward, but there were no high winds north of the Virginia Capes. Northeast storm warnings were then ordered extended from Norfolk to New York. By 1 p. m. of the 3d the storm center had passed inland to Raleigh, N. C., where the barometer reading was 29.44 inches, and the wind velocities ranged from 38 to 48 miles an hour between Raleigh and Cape Henry. Directly eastward to the coast the storm was more severe and telegraph communication had ceased early in the day. By 8 p. m. of the 3d, the storm, central over interior North Carolina, had spent its force, without any high winds north of Virginia, and on the following morning it was central as a very moderate low over the mountains of North Carolina. Later it drifted westward without further change, and was lost over eastern Texas during the 6th without effect during the last three days of its existence other than general and frequently heavy showers in the south Atlantic and Gulf States. While the storm caused only a few marine disasters, it did great damage in eastern North Carolina and the loss of 5 human lives was reported. The losses were of the character usually experienced during great storms and they are said to have amounted to four or five millions of dollars.

During this time (September 1 to 6, inclusive) weather conditions changed but little over the interior of the country. The low-pressure areas kept well to the northward and there were showers from the upper Lake region westward, while abnormally hot and dry weather continued over the great corn belt and the Northwest, and at times covered the upper Lake region. In the lower Lake region and the North Atlantic States there were some light local showers with moderate temperatures, except during two or three days when warm weather prevailed over the southern portion of the Middle Atlantic States. Over the extreme West the weather was fair with variable temperatures, but within seasonable limits. A moderate low-pressure area that moved leisurely across the extreme northern portion of the country from the 1st to the 8th was attended by general showers over the northern tier of States and was followed by a pronounced cool, high-pressure area that really marked the dissolution of the hot wave over the great central valleys and the Plains States. The westward drift of the North Carolina storm left a moderate low-pressure area over Texas on the 7th and 8th, and this latter, with the cool, high area to the northward, produced the combination necessary to cause general showers over the central West and to terminate the heat wave that had persisted over those sections for so many weeks. General showers occurred on the 8th with a strong, high area central over Lake Superior, and

from that time there were frequent and substantial showers until the 17th, with moderate temperatures. A trough of low pressure drifted eastward from the 9th to the 13th, inclusive, and it was closely followed by another strong, high area that reached the north-central portion of the country just as a moderate depression from the mouth of the Rio Grande had reached the northern Texas coast. This latter disturbance moved northeastward with great deliberateness, and with steadily decreasing intensity after leaving Louisiana, and finally passed beyond the Canadian Maritime Provinces during the 18th and 19th, with a slight recovery of energy after the 17th. The rains resulting from this storm were general and practically continuous east of the Rocky Mountains for several days, and over the Gulf States the rainfall was excessively heavy. There was also a remarkably heavy fall over extreme western South Dakota during the 24 hours ending at 8 p. m. of the 16th. The disturbance at the mouth of the Rio Grande appeared during the 12th and small craft warnings were displayed on the following morning along the middle Gulf coast. Later in the day the warnings were changed to southeast storm warnings, and high winds occurred as indicated during the 13th and 14th.

The strong, high-pressure area that moved over the northern portion of the country from the 7th to the 10th, inclusive, was accompanied by much lower temperatures, and frost occurred on the morning of the 10th in interior New York and northwestern New England. Warnings for these frosts were issued on the previous day. Local frosts also occurred on the 11th and 12th over the extreme Northwest.

Another strong, high-pressure wave from the Northwest moved across the Northern States from the 9th to the 16th, inclusive, attended by general frosts from Montana eastward to the Atlantic Ocean, for which warnings were issued at the proper time. In the northern portions of eastern New York and Vermont the temperatures on the morning of the 15th were the lowest of record for the month of September, and on the following morning temperatures below freezing occurred in the cranberry marshes of New Jersey.

West of the Rocky Mountains weather and temperature conditions were such as usually prevail during the month of September until the 10th of the month, when temperature began to rise in California as a result of the low pressure over Arizona and extreme southern California and the high pressure over the extreme Northwest. These general conditions prevailed with some interruptions until the climax was reached on the 16th and 17th. On the 16th the maximum temperature of 102° at San Francisco was the highest temperature of record at that place, and on the 17th the maximum of 110° at San Diego and San Luis Obispo was also the highest temperature of record at those points. At Los Angeles on the same day the September record of 108° was equaled. After the 17th low pressure appeared over the Northwest and a reaction to normal conditions set in, except in the Great Valley, where high temperatures continued.

A depression appeared over Alberta on the 16th, which moved very slowly eastward, attended by rains, reaching the upper Lake region on the 20th with excellent definition, and the rain area then extended into the central valleys and the Southwest. The storm increased somewhat in energy over the upper Lake region and moved to the northeastward. The extreme southern portion continued to drift eastward and was last noted over the Gulf of St. Lawrence on the evening of the 23d. A slight secondary depression formed during the night of the 20th-21st over western North Carolina, the rain area from the Lake disturbance joined with the one that had persisted over the Atlantic States since the 17th, and it was not until the 23d that the last rain fell in the State of Maine. Another high area of pronounced character followed this disturbance, with clear and much colder weather, necessitating warnings on the 19th of frost and freezing temperatures for the northwestern States and, later, warnings of general frosts for the central valleys, the Lake region, the East, and portions of the South. The frosts occurred generally as forecast, except in New England, and on the morning of the 22d light frost was reported as far south as northern Alabama.

A disturbance from the north Pacific Ocean reached British Columbia on the morning of the 21st. It first caused some rains over the central and northern sections west of the Rocky Mountains and, while it moved easterly over the Canadian Northwest, it also sent an offshoot down along both slopes of the Rocky Mountains and during the 22d the rain area extended into Colorado, Utah, and Arizona, while a well-defined disturbance was central over extreme southwestern Kansas, the northern section of the depression having practically disappeared. There was at the same time a depression over Arizona and both it and the Kansas depression moved northeastward so that by the evening of the 23d there was a single narrow trough of low pressure extending from western Texas to eastern Nebraska, with a strong cool high area on each side and rains and snows with the northwestern high. The low trough drifted slowly eastward with rains and snows and low temperatures continuing to the westward, and by the evening of the 25th there was a moderate depression over Lake Michigan and another increasing one near the mouth of the Rio Grande with the western cool high area pushing down between. The rain area had in the meantime contracted to the limits of the depression and heavy rains fell at various times from the 24th to the 26th, inclusive, over Oklahoma, Texas, and western Louisiana, and by the morning of the 26th, the rain area had extended through the upper Lake region, Illinois and Indiana. At this time the Texas coast disturbance was apparently increasing in energy. Cautionary advices had already been issued on the previous evening and on the morning of the 26th storm warnings were ordered for the Texas coast. High pressure continued over the central West with clear and frosty weather while over the East pressure was falling slowly with a moderate depression over the St. Lawrence Valley, the remains of the low trough of the few days immediately preceding. The Texas coast depression did not move and it appears to have dissipated during the 28th, the rain in the west Gulf States continuing until that time. The cool, high area to the northward continued eastward with a loss of intensity on the 26th, but with a recovery on the following day, and on the 27th and 28th general frosts occurred from the Lake region and upper Ohio Valley eastward, with generally fair weather that continued until the end of the month in New York and New England.

After the passage of this high area came a weak and erratic low from the Canadian Northwest, and a general pressure fall ensued, accompanied by rains in the Pacific Northwest, and later east of the Rocky Mountains, and at the end of the month rains of a local character were still in progress east of the Mississippi River with dense fog prevailing over the upper Lake region and the Ohio Valley on account of the pressure stagnation. A high area of good proportions and with falling temperatures appeared over the north Pacific coast on the evening of the 28th and at the end of the month the high pressure and cold weather had reached Montana and Wyoming.

*Average temperatures and departures from the normal.*

| Districts. | Number of stations. | Average temperatures for the current month. | Departures for the current month. | Accumulated departures since Jan. 1. | Average departures since Jan. 1. |
|---|---|---|---|---|---|
| New England | 12 | 59.4 | −1.3 | +14.1 | −1.6 |
| Middle Atlantic | 15 | 65.6 | −0.6 | +20.5 | +2.3 |
| South Atlantic | 10 | 71.8 | −1.3 | +15.1 | +1.7 |
| Florida Peninsula[1] | 9 | 79.6 | −0.7 | + 8.9 | +1.0 |
| East Gulf | 11 | 74.1 | −0.7 | + 6.2 | +0.7 |
| West Gulf | 11 | 73.8 | −1.9 | − 4.3 | −0.5 |
| Ohio Valley and Tennessee | 14 | 68.2 | 0.0 | +12.3 | +1.4 |
| Lower Lakes | 11 | 61.4 | −1.8 | + 6.9 | +0.8 |
| Upper Lakes | 13 | 59.0 | −0.1 | + 3.4 | +0.4 |
| North Dakota[1] | 9 | 57.1 | +0.6 | + 0.7 | +0.1 |
| Upper Mississippi Valley | 14 | 65.6 | +0.8 | + 8.2 | +0.9 |
| Missouri Valley | 12 | 66.5 | +1.2 | + 2.1 | +0.2 |
| Northern slope | 9 | 57.0 | −0.4 | − 7.7 | +0.9 |
| Middle slope | 6 | 65.4 | −2.2 | + 2.8 | +0.3 |
| Southern slope[1] | 8 | 69.9 | −2.6 | − 5.4 | −0.6 |
| Southern Plateau[1] | 9 | 71.8 | −0.9 | −20.9 | −2.3 |
| Middle Plateau[1] | 10 | 58.8 | +0.3 | − 7.3 | −0.8 |
| Northern Plateau[1] | 11 | 59.0 | +0.3 | −12.3 | +1.4 |
| North Pacific | 7 | 57.8 | +0.9 | − 1.4 | −0.2 |
| Middle Pacific | 7 | 66.4 | +2.9 | + 1.8 | +0.2 |
| South Pacific | 4 | 71.9 | +4.6 | + 9.5 | +1.1 |

[1] Regular Weather Bureau and selected cooperative stations.

*Average precipitation and departures from the normal.*

| Districts. | Number of stations. | Average. | | Departure. | |
|---|---|---|---|---|---|
| | | Current month. | Per centage of normal. | Current month. | Accumulated since Jan. 1. |
| New England | 11 | 3.20 | 100 | 0.00 | −5.20 |
| Middle Atlantic | 15 | 3.12 | 94 | −0.20 | −2.90 |
| South Atlantic | 11 | 5.03 | 106 | +0.30 | −4.70 |
| Florida Peninsula[1] | 9 | 5.41 | 72 | −2.10 | −6.00 |
| East Gulf | 11 | 7.91 | 164 | +3.10 | +1.30 |
| West Gulf | 10 | 8.75 | 253 | +5.30 | −0.10 |
| Ohio Valley and Tennessee | 14 | 3.16 | 114 | +0.40 | +1.30 |
| Lower Lakes | 10 | 1.99 | 71 | −0.80 | +1.30 |
| Upper Lakes | 14 | 2.51 | 78 | −0.70 | −1.20 |
| North Dakota[1] | 9 | 1.56 | 100 | 0.00 | −3.80 |
| Upper Mississippi Valley | 15 | 3.09 | 94 | −0.20 | −3.10 |
| Missouri Valley | 12 | 2.76 | 104 | +0.10 | −4.90 |
| Northern slope | 9 | 1.78 | 165 | +0.70 | +0.20 |
| Middle slope | 6 | 3.36 | 171 | +1.40 | −2.80 |
| Southern slope[1] | 8 | 3.88 | 144 | +1.20 | −3.30 |
| Southern Plateau[1] | 9 | 0.57 | 66 | −0.30 | −1.10 |
| Middle Plateau[1] | 11 | 1.01 | 111 | +0.10 | −0.80 |
| Northern Plateau[1] | 11 | 0.70 | 78 | −0.20 | −0.70 |
| North Pacific | 7 | 3.06 | 120 | +0.50 | −4.10 |
| Middle Pacific | 6 | 0.08 | 14 | −0.50 | −8.20 |
| South Pacific | 4 | 0.03 | 13 | −0.20 | −2.10 |

[1] Regular Weather Bureau and selected cooperative stations.

*Average relative humidity and departure from the normal.*

| Districts. | Average. | Departure from the normal. | Districts. | Average. | Departure from the normal. |
|---|---|---|---|---|---|
| New England | 80 | − 1 | Missouri Valley | 64 | − 2 |
| Middle Atlantic | 77 | 0 | Northern slope | 60 | + 5 |
| South Atlantic | 80 | 0 | Middle slope | 65 | + 7 |
| Florida Peninsula | 78 | − 3 | Southern slope | 66 | + 3 |
| East Gulf | 80 | + 4 | Southern Plateau | 46 | + 7 |
| West Gulf | 79 | + 5 | Middle Plateau | 47 | + 9 |
| Ohio Valley and Tennessee | 73 | + 1 | Northern Plateau | 45 | − 7 |
| Lower Lakes | 72 | − 1 | North Pacific | 76 | + 4 |
| Upper Lakes | 77 | 0 | Middle Pacific | 57 | −10 |
| North Dakota | 70 | + 4 | South Pacific | 50 | −16 |
| Upper Mississippi Valley | 72 | 0 | | | |

*Average cloudiness and departure from the normal.*

| Districts. | Average. | Departure from the normal. | Districts. | Average. | Departure from the normal. |
|---|---|---|---|---|---|
| New England | 5.2 | 0.0 | Missouri Valley | 4.9 | +0.9 |
| Middle Atlantic | 5.4 | +0.8 | Northern slope | 4.1 | +0.1 |
| South Atlantic | 5.2 | +0.5 | Middle slope | 4.8 | +1.4 |
| Florida Peninsula | 5.4 | 0.0 | Southern slope | 4.3 | +0.5 |
| East Gulf | 5.9 | +1.3 | Southern Plateau | 2.3 | −0.2 |
| West Gulf | 6.0 | +1.8 | Middle Plateau | 3.1 | +0.2 |
| Ohio Valley and Tennessee | 5.7 | +1.3 | Northern Plateau | 3.2 | −0.4 |
| Lower Lakes | 5.1 | +0.3 | North Pacific | 4.6 | −0.7 |
| Upper Lakes | 5.1 | −0.1 | Middle Pacific | 2.2 | −1.2 |
| North Dakota | 4.1 | −0.3 | South Pacific | 1.8 | −0.8 |
| Upper Mississippi Valley | 5.2 | +0.9 | | | |

*Maximum wind velocity.*

| Stations. | Date. | Velocity. | Direction. | Stations. | Date. | Velocity. | Direction. |
|---|---|---|---|---|---|---|---|
| Buffalo, N. Y. | 26 | 50 | nw. | Mount Tamalpais, Cal. | 28 | 69 | nw. |
| Charleston, S. C. | 9 | 62 | ne. | New York, N. Y. | 21 | 54 | se. |
| Cheyenne, Wyo. | 8 | 50 | s. | Norfolk, Va. | 3 | 50 | e. |
| El Paso, Tex. | 22 | 56 | sw. | North Head, Wash. | 2 | 68 | se. |
| Grand Junction, Colo. | 22 | 56 | nw. | Do. | 3 | 60 | se. |
| Hatteras, N. C. | 2 | 50 | ne. | Pensacola, Fla. | 15 | 52 | s. |
| Do. | 3 | 74 | se. | Point Reyes Light, Cal. | 8 | 62 | nw. |
| Modena, Utah. | 21 | 52 | nw. | Do. | 28 | 59 | nw. |
| Mount Tamalpais, Cal. | 1 | 52 | sw. | Tatoosh Island, Wash. | 3 | 52 | s. |
| Do. | 4 | 56 | nw. | | | | |
| Do. | 5 | 60 | nw. | | | | |